

REMARKS

INTRODUCTION

In accordance with the foregoing, claims 1-3, 13, 14, 29, 32-34, 38, and 50 have been amended. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1-53 are pending and under consideration. Reconsideration is respectfully requested.

OBJECTIONS TO THE CLAIMS

In the Office Action at pages 2-3, numbered item 3, claims 1, 32-34, and 38 were objected to. Claim 1 has been amended to recite "from an outer circumference side of the pattern curves" and "inner circumference side of the pattern curves." The grammatical errors in claims 32-34 have been corrected. Claim 38 has been amended to recite "a number of pattern curves" in order to provide antecedent basis. Thus, Applicant respectfully submits that the outstanding claim objections should be resolved.

Reconsideration and withdrawal of the outstanding objections to claims 1, 32-34, and 38 is respectfully requested.

ALLOWABLE SUBJECT MATTER

In the outstanding Office Action at page 8, the Examiner indicated that claims 15-28, 31, 34, 37, 40, 43, 46, and 49 are allowed. Additionally, the Examiner indicated that claims 4-12, 30, 33, 36, 39, 42, 45, 48, 51, and 53 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

REJECTION UNDER 35 U.S.C. §102

Claims 1, 3, and 14

In the Office Action at pages 3-4, numbered item 4, claims 1, 13, and 14 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,555,314 to Nakajima. This rejection is traversed and reconsideration is requested.

Independent claim 1, as amended, is directed to a pattern-center determination apparatus for determining a pattern center of a fingerprint-like pattern, which is formed with a

number of pattern curves. As amended, independent claim 1 recites "an auxiliary-line generation section for generating two or more auxiliary lines extending continuously from an outer circumference side of the pattern curves of the fingerprint-like pattern toward an inner circumference side of the pattern curves so that each of the two or more auxiliary lines intersects each of the pattern curves perpendicularly or substantially perpendicularly" and "a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by said auxiliary-line generation section intersect with each other." Using this arrangement, the amount of calculation necessary can be reduced significantly in comparison with the conventional technique, thus it is possible to determine the pattern center of a fingerprint-like pattern at a high speed.

Nakajima, in contrast, teaches a method for extracting a reference point of a fingerprint image. According to the method taught by Nakajima, the fingerprint image is scanned linearly in the X and Y directions to obtain the cross points (P1, P2) of the scan lines (L1, L2) and the ridge (R) of the fingerprint image. The point having the maximum number of cross points (LM) in both the X and Y directions is settled as a reference point. See Nakajima at col. 2, line 64 to col. 3, line 5, col. 3, lines 22-25, and Figures 3 and 4. Nakajima fails to teach or suggest "generating two or more auxiliary lines extending continuously from an outer circumference side toward an inner circumference side of the pattern curves of a fingerprint-like pattern so that each of the two or more auxiliary lines intersects each of the pattern curves perpendicularly or substantially perpendicularly" or "a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by said auxiliary-line generation section intersect with each other," as recited in amended independent claim 1.

As Nakajima fails to teach or suggest all of the features of amended independent claim 1, Applicant respectfully submits that amended independent claim 1, and all claims depending directly or indirectly therefrom, patentably distinguish over the prior art and are in condition for allowance.

Independent claim 14 has been amended to recite "a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by said auxiliary-line generation section intersect with each other." As discussed with respect to amended independent claim 1, Applicant respectfully submits that Nakajima fails to teach or suggest at least this feature of amended independent claim 14. Accordingly, Applicant respectfully submits that claim 14 patentably distinguishes over the prior art and is in condition for allowance.

Claims 50 and 52

In the Office Action at pages 4-5, numbered item 5, claims 50 and 52 were rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,241,288 to Bergenek. This rejection is traversed and reconsideration is requested.

Independent claim 50 is directed to a pattern alignment apparatus for aligning two fingerprint-like patterns, each of which is formed with a number of pattern curves, while adjusting the alignment of the two fingerprint-like patterns. In relevant part, claim 50 recites that the apparatus includes "a collation section for collating the two groups of minutiae extracted from the two fingerprint-like patterns by said minutia extraction section, based on a result of the alignment by the alignment section," "an adjustment-shift calculation section for calculating an adjustment shift amount based on a result of the collation by said collation section, by which amount at least one of the two fingerprint-like patterns is shifted for adjusting the result of the alignment of the two fingerprint-like patterns so that the alignment is improved," and "an alignment-result adjustment section for shifting at least one of the two fingerprint-like patterns by the adjustment shift amount calculated by said adjustment-shift calculation section so as to adjust the result of the alignment by said alignment section." With the arrangement of amended independent claim 50, the alignment can be improved based on the minutiae of the fingerprint-like patterns. Thus, it is possible to verify or authenticate the fingerprint-like patterns efficiently and with high precision.

Bergenek, in contrast, teaches a fingerprint identification/verification system using bitmaps of a stored fingerprint to correlate with a bitmap of an input fingerprint. Bergenek, however, teaches that a portion in the center region of the input fingerprint image is correlated with a center portion of the stored fingerprint image on a pixel-by-pixel basis. When the match between these portions is not acceptable, different center portions of the input fingerprint are selected with rotating the input fingerprint bit by bit, and additional correlations are performed using the reselected center portions. See Bergenek at col. 14, lines 7-53. Applicant respectfully submits that Bergenek fails to teach or suggest "calculating an adjustment shift amount based on a result of the collation by said collation section, by which amount at least one of the two fingerprint-like patterns is shifted for adjusting the result of the alignment of the two fingerprint-like patterns so that the alignment is improved" and "shifting at least one of the two fingerprint-like patterns by the adjustment shift amount calculated by said adjustment-shift calculation section so as to adjust the result of the alignment by said alignment section," as recited in amended independent claim 50. For at least these reasons, Applicant respectfully submits that

amended independent claim 50, and those claims depending directly or indirectly therefrom, patentably distinguish over the prior art and are in condition for allowance.

REJECTION UNDER 35 U.S.C. §103

Claims 2 and 3

In the Office Action at pages 5-6, numbered item 6, claims 2 and 3 were rejected under 35 U.S.C. §103(a) as being unpatentable over Nakajima and U.S. Patent No. 6,282,302 to Hara. The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Claims 2 and 3 depend directly from amended independent claim 1. As discussed above, Nakajima fails to teach or suggest all of the features of amended independent claim 1. The Examiner relies on Hara only to teach the features not found in amended independent claim 1. In view of this, Applicant respectfully submits that Nakajima and Hara, taken alone or in combination, fail to teach or suggest all of the features of dependent claims 2 and 3. Accordingly, Applicant respectfully submits that claims 2 and 3 patentably distinguish over the prior art and are in condition for allowance.

Claims 29, 32, 35, 38, 41, 44, and 47

In the Office Action at pages 7-13, numbered item 7, claims 29, 32, 35, 38, 41, 44, and 47 were rejected under 35 U.S.C. §103(a) as being unpatentable over Bergenek and Nakajima. The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

Amended independent claim 29 is directed to a pattern alignment apparatus for aligning two fingerprint-like patterns, each of which is formed with a number of pattern curves. In relevant part, amended independent claim 29 recites "a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by said auxiliary-line generation section intersect with each other." As discussed above with respect to amended independent claim 1, Nakajima fails to teach or suggest that auxiliary lines are generated, or that the pattern-center is determined using the auxiliary lines. Bergenek also fails to teach or suggest these features. As Bergenek and Nakajima, taken alone or in combination, fail to teach or suggest all of the features of amended independent claim 29, Applicant respectfully submits that amended independent claim 29 and those claims depending directly or indirectly therefrom patentably distinguish over the prior art and are in condition for allowance.

Amended independent claim 38 is directed to a pattern verification apparatus for verifying

a group of object minutiae for verification extracted from an object fingerprint-like pattern for verification with a group of registered minutiae extracted in advance from a registered fingerprint-like pattern, each of the object fingerprint-like pattern and the registered fingerprint-like pattern being formed with a number of pattern curves. Specifically, the apparatus of claim 38 includes an alignment-reference determination section that includes, in relevant part, "a pattern-center determination section for determining the pattern center based on one or more intersecting points at which the two or more auxiliary lines generated by said auxiliary-line generation section intersect with each other." As discussed above with respect to amended independent claim 1, Nakajima fails to teach or suggest that auxiliary lines are generated, or that the pattern-center is determined using the auxiliary lines. Bergenek also fails to teach or suggest these features. As Bergenek and Nakajima, taken alone or in combination, fail to teach or suggest all of the features of amended independent claim 38, Applicant respectfully submits that amended independent claim 38 and those claims depending directly or indirectly therefrom patentably distinguish over the prior art and are in condition for allowance

CONCLUSION

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot. And further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.


If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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